

UNITED STATES DEPARTMENT OF AGRICULTURE
Rural Utilities Service
Technical Standards Committee "A"

Supplement No. 2, January 2005, to
RUS Informational Publication 202-1,
List of Materials Acceptable for Use on
Systems of RUS Electrification Borrowers

The attached pages dated January 2005, for the "List of Materials Acceptable for Use on Systems of RUS Electrification Borrowers" are those which have been revised by action of the Technical Standards Committees during the months of October through December, 2004. They replace pages dated July 2004 and October 2004. The following changes should be made in order to keep RUS Informational Publication 202-1 up to date.

| <u>Remove</u> <u>Old Page</u> | <u>Add</u> <u>New Page</u> |
|----------------------------------|-------------------------------|
| a-1:a(1) Cond | ai-1:BLANK |
| f(1) Cond:g(1) Cond | f(1) Cond:g(1) Cond |
| g(1.1) Cond: h, i-1 | g(1.1) Cond:h, i-1 |
| k(1) Cond:k(2) Cond | k(1) Cond:k(2) Cond |
| ae(2) Cond:af-1 | ae(2) Cond:af-1 |
| at(1) Cond:av-1 | at(1) Cond:av-1 |
| be(4) Cond:be(4.1) Cond | be(4) Cond:be(4.1) Cond |
| cg-4:cg(1) Cond | cg-4:cg(1) Cond |
| NEW | cm(1) Cond:BLANK |
| gj-1:gj(1) Cond | gj-1:gj(1) Cond |
| rp(1) Cond:sb-1 | rp(1) Cond:sb-1 |
| sd-1:sd(1) Cond | sd-1:sd(1) Cond |
| se-1:se(1) Cond | se-1:se(1) Cond |
| U ae(2) Cond:U ae(2.1) Cond | U ae(2) Cond:U ae(2.1) Cond |
| U fw-1:U fz-1 | U fw-1:U fz-1 |
| U gc-1:U gk-1 | U gc-1:U gk-1 |
| U gk-2:Ugn-1 | U gk-2:Ugn-1 |
| U gn-2:U go-1 | U gn-2:U go-1 |
| U gq-1:Ugu-1 | U gq-1:Ugu-1 |
| U gu-2.1:U gv-1 | U gu-2.1:U gv-1 |
| U hf(1) Cond:U fh(2) Cond | U hf(1) Cond:U fh(2) Cond |
| U hr-1:U hv-1 | U hr-1:U hv-1 |
| U hy-1.1:U hy-1.2 | U hy-1.1:U hy-1.2 |

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a - Insulator, pin type

| | | | |
|--|--|---|--|
| ANSI Class | 55-2 | 55-3 | 55-4 |
| Application | 5 kV | 12.5/7.2 kV and 13.2/7.62 kV systems | 12.5/7.2 kV and 13.2/7.62 kV systems (where greater insulation is needed) |
| Pinhole diameter | 1 in. | 1 in. | 1 in. |
| Porcelain Products (Knox) ² | 253 | 261-S | 366-S |
| Victor Insulators, Inc. | 8 | 5 | 6 |
| ANSI Class | 56-1 | 56-3 | 56-4 |
| Application | 24.9/14.4 kV distribution lines | 33 - 34.5 kV transmission lines | 44 - 46 kV transmission lines |
| Pinhole diameter | 1-3/8 in. Metal thimble (unless noted) | 1-3/8 in. Metal thimble | 1-3/8 in. Metal thimble |
| Porcelain Products (Knox) ² | 1027-S | 2045-S | - |
| Victor Insulators, Inc. | 27-R ¹ | 245-R | 255-R |

¹Does not have a metal thimble.

²ANSI class 55-2, 55-3, 55-4, and 56-1 pin insulators manufactured at both the Knoxville and Macomb plants are acceptable.

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f - Pin, crossarm
(Non-lead threads)
(With square washer, nut and MF locknut)

| Manufacturer | Conditions |
|--------------------------------------|-----------------------|
| <u>Hubbell</u> | |
| 881P - 1" thread, 5 3/4" shank | To obtain experience. |
| 886P - 1" thread, 1 1/2" shank | |
| <u>Hughes Brothers</u> | |
| 2775-A5-3/4, 1" thread, 5-3/4" shank | To obtain experience. |
| <u>Joslyn</u> | |
| J203Z, 1" thread, 5-3/4" shank | To obtain experience. |
| J221Z, 1" thread, 1-1/2" shank | |
| J647Z, 1-3/8" thread, 7" shank | |
| J630Z, 1-3/8" thread, 1-3/4" shank | |

Conditional List
g(1)
January 2005

g - Crossarms, fiberglass

| <u>Manufacturer</u> | <u>Description</u> | <u>Conditions</u> |
|--|--------------------------|-----------------------|
| <u>Geotek (PUP)</u> | | |
| <u>Braced Application</u> | | |
| T2000-96-03X | 8' Type-3 Drill Pattern | To obtain experience. |
| T2000-96-04X | 8' Type-4 Drill Pattern | |
| T2000-120-05X | 10' Type-5 Drill Pattern | |
| T3000-96-03X | 8' Type-3 Drill Pattern | |
| T3000-96-04X | 8' Type-4 Drill Pattern | |
| T3000-120-05X | 10' Type-5 Drill Pattern | |
| (X = color code) | | |
| <u>Braceless (Centermount) Application</u> | | |
| TB2000-96-03X | 8' Type-3 Drill Pattern | To obtain experience. |
| TB2000-96-04X | 8' Type-4 Drill Pattern | |
| TB2000-120-05X | 10' Type-5 Drill Pattern | |
| TB3000-96-03X | 8' Type-3 Drill Pattern | |
| TB3000-96-04X | 8' Type-4 Drill Pattern | |
| TB3000-120-05X | 10' Type-5 Drill Pattern | |
| (X = color code) | | |
| <u>MacLean Power Systems</u> | | |
| <u>Braced Application</u> | | |
| PX08REA003 | 8' Type-3 Drill Pattern | To obtain experience. |
| PX08REA004 | 8' Type-4 Drill Pattern | |
| PX10REA005 | 10' Type-5 Drill Pattern | |
| <u>Braceless (Centermount) Application</u> | | |
| PX08ST003 | 8' Type-3 Drill Pattern | To obtain experience. |
| PX08ST004 | 8' Type-4 Drill Pattern | |
| PX10ST005 | 10' Type-5 Drill Pattern | |
| <u>Powertrusion International, Inc.</u> | | |
| <u>Braced Application</u> | | |
| PST08001NR03 | 8' Type-3 Drill Pattern | To obtain experience. |
| PST08001NR04 | 8' Type-4 Drill Pattern | |
| PST10001NR05 | 10' Type-5 Drill Pattern | |
| PHT08001NR03 | 8' Type-3 Drill Pattern | |
| PHT08001NR04 | 8' Type-4 Drill Pattern | |
| PHT10001NR05 | 10' Type-5 Drill Pattern | |
| <u>Braceless (Centermount) Application</u> | | |
| PST08001BR03 | 8' Type-3 Drill Pattern | To obtain experience. |
| PST08001BR04 | 8' Type-4 Drill Pattern | |
| PST10001BR05 | 10' Type-5 Drill Pattern | |
| PHT08001BR03 | 8' Type-3 Drill Pattern | |
| PHT08001BR04 | 8' Type-4 Drill Pattern | |
| PHT10001BR05 | 10' Type-5 Drill Pattern | |

Note: Gripping studs or teeth on clamp type crossarm pins (item f) should not be installed against the surface of the fiberglass crossarms.

g - Crossarms, fiberglass

| <u>Manufacturer</u> | <u>Description</u> | <u>Conditions</u> |
|---|--------------------------|-----------------------|
| <u>Shakespeare</u> | | |
| LSC-REA-03-(X)** | 8' Type-3 Drill Pattern | To obtain experience. |
| LSC-REA-04-(X)** | 8' Type-4 Drill Pattern | |
| LSC-REA-05-(X)** | 10' Type-5 Drill Pattern | |
| (**X=2-gray color or 5-dark bronze color) | | |

Note: Gripping studs or teeth on clamp type crossarm pins (item f) should not be installed against the surface of the fiberglass crossarms.

h - Brace, crossarm, steel

Wherever item "h" is shown on a construction drawing, use a brace from page cu.

i - Bolt, carriage

Applicable Specification: ANSI C135.1, "Standard for Galvanized Steel Bolts and Nuts."

Applicable Sizes: 3/8 inch diameter, 3 through 6 inch length
 1/2 inch diameter, 3 through 6 inch length

The following manufacturers have shown compliance with the applicable specifications for carriage bolts.

Dixie Electrical Manufacturing Company
Hubbell (Chance)
Hughes Brothers
Joslyn Manufacturing Company
Kortick Manufacturing Company
MacLean (Continental)
The Rockford Bolt & Steel Company

k - Insulator, suspension

| Manufacturer | Conditions |
|--|-----------------------|
| <u>Sediver</u> 10" suspension insulator N-8R2 (ball & socket, 20,000 lbs.) CT-14R2 (clevis, 30,000 lbs.) N-14R2 (ball & socket, 30,000 lbs.) | To obtain experience. |

k - Insulator, polymer distribution deadend

| Manufacturer | Conditions |
|-------------------------------------|---|
| <u>Dulmison</u> | |
| Distribution deadend | 1. To obtain experience. |
| H-15 kV-4 | 2. For use as deadends on distribution lines only. |
| H-25 kV-6 | 3. Not recommended for use in areas subject to contamination. |
| <u>GLP</u> | |
| DS-15 (15 kV) | 1. Same as (1) above. |
| DS-28 (25 kV) | 2. Same as (2) above. |
| | 3. Same as (3) above. |
| <u>Hubbell (Ohio Brass)</u> | |
| "Veri*Lite" | 1. Same as (1) above. |
| Type PDI-15 (15 kV) | 2. Same as (2) above. |
| Type PDI-25 (25 kV) | 3. Same as (3) above. |
| Type PDI-35 (35 kV) | |
| <u>K-Line</u> | |
| Distribution deadend | 1. Same as (1) above. |
| KL-15ASCTM (15 kV line-to-line) | 2. Same as (2) above. |
| KL-28ASCTM (25 kV line-to-line) | 3. Same as (3) above. |
| KL-35SCTM (35 kV line-to-line) | |
| <u>MacLean (Reliable)</u> | |
| DS-15G (15 kV) | 1. Same as (1) above. |
| DS-15M (15 kV) (metal end fittings) | 2. Same as (2) above. |
| DS-28G (25 kV) | 3. Same as (3) above. |
| DS-28M (25 kV) (metal end fittings) | |
| DS-35G (35 kV) | |
| DS-35M (35 kV) (metal end fittings) | |
| <u>Porcelain Products</u> | |
| Distribution deadend | 1. Same as (1) above. |
| PDEI-15, 15 kV | 2. Same as (2) above. |
| PDEI-25, 25 kV | 3. Same as (3) above. |

NOTE: When insulators from this page are used, adjust construction drawing material list quantities as necessary. Recommended maximum working load is 5,000 lbs.

ae - Surge Arrester, Substation*

CONDITION OF ACCEPTANCE: To Obtain Experience

| MOV Type | | | | |
|------------------------------------|------------------|-----------------------|-----------|------------------------------------|
| Manufacturer | Type | Accepted Ratings - kV | Housing | Manufacturer's Classification |
| ABB | SMX-30 | 3-312 | Porcelain | Station |
| Cooper Power Systems | VariStar | 3-312 | Porcelain | Station |
| | VariStar AZF | 3-120 | Porcelain | Intermediate |
| | VariSTAR US | 120-140 | Polymer | Station – 5.6 kJ/kV ⁽¹⁾ |
| | VariSTAR UI | 3-108 | Polymer | Intermediate |
| | VariSTAR US | 3-108 | Polymer | Station - 3.4 kJ/kV ⁽¹⁾ |
| | VariSTAR US | 3-108 | Polymer | Station - 3.4 kJ/kV |
| | VariSTAR UH | 3-108 | Polymer | Station - 5.6 kJ/kV |
| | VariSTAR UH | 3-108 | Polymer | Station - 5.6 kJ/kV ⁽¹⁾ |
| | VariSTAR UH | 120-140 | Polymer | Station - 8.9 kJ/kV ⁽¹⁾ |
| | VariSTAR UX | 3-108 | Polymer | Station - 8.9 kJ/kV ⁽¹⁾ |
| General Electric | Tranquell | 2.7-612 | Porcelain | Station |
| | Tranquell | 3-120 | Porcelain | Intermediate |
| Hubbell Power Systems (Ohio Brass) | PVI-LP | 3-72 | Polymer | Intermediate |
| | PVIA | 3-72 | Polymer | Intermediate |
| | DynaVar Type PVI | 3-144 | Polymer | Intermediate |
| | DynaVar Type PVN | 3-228 | Polymer | Station |
| Joslyn | Type ZS | 3-240 | Porcelain | Station |
| | Type ZSH | 258-468 | Porcelain | Station |
| | Type ZIP | 3-120 | Polymer | Intermediate |
| | Type ZSP | 3-144 | Polymer | Station |
| MagneTek | ZSE-E2A | 3-39 | Porcelain | Station |
| | ZSE-E3A | 45-312 | Porcelain | Station |
| Siemens Power | 3EQ1 | 36-240 | Polymer | Station |
| | 3EQ4 | 96-444 | Polymer | Station |
| | 3EP2 | 12-384 | Porcelain | Station |
| | 3EP4 | 12-150 | Porcelain | Station |

*For instructions concerning application at substations refer to RUS Bulletin 1724E-300, "Design Guide for Rural Substations." In the purchase of arresters, care should be taken to select the type and voltage rating in accordance with the line voltage and the type of construction (grounded or ungrounded).

(1) Energy ratings based on single impulse ratings

af - Cutouts, Distribution, Open

| Manufacturer | Type | Voltage Rating |
|------------------------------|---------------|----------------|
| ABB | ICX | 15, 27 kV |
| | LBU-II | 15, 27 kV |
| Cooper Power Systems | S1 | 15, 27 kV |
| | L | 15, 27 kV |
| Hubbell (Chance) | C | 15, 27, 35 kV |
| | C (loadbreak) | 15, 27, 35 kV |
| Kearney/Cooper Power Systems | HX | 15, 27 kV |
| Power Line Hardware | DHC | 15, 27 kV |
| S & C Electric | XS | 15, 27 kV |
| Southern States | Series 66 | 15, 27 kV |
| | Series 70 | 15 kV |

NOTE: The buyer should specify the load rating, voltage rating, interrupting rating and required accessories.

Cutouts used on underground riser poles should be loadbreak type or have hooks for portable load interrupters.

af - Cutout, open-link fuse support

| Manufacturer | Mounting | 12.5/7.2 kV 50 amp. | 24.9/14.4 kV 50 amp. |
|------------------------------|---------------------|------------------------|-------------------------|
| Cooper Power Systems | Crossarm Bushing | FT1A2 | FT1A4 |
| | | FT10A3 | - |
| Kearney/Cooper Power Systems | Crossarm Bushing | 6484-55 | - |
| | | 6483-59 | - |

NOTE: The open link fuse supports listed above are fuse supports only and have no inherent interrupting capacity. They should be used with fuse links capable of interrupting at least 1200 amperes and for transformer protection only.

at - Reflective Guy Marker, 8-foot length

Plastic or Fiberglass

| Manufacturer | Conditions |
|----------------------------------|-----------------------|
| * <u>Nordic</u> HG-815 yellow | To obtain experience. |

*For use with formed or automatic type deadends for guy strand; will not fit over bolt type guy clamps.

av - Conductor, ACSR

Applicable Specification: ASTM Specification B 232

Preferred Sizes:

| <u>Distribution</u> | <u>Transmission</u> |
|---------------------|---------------------|
| 4 - 6/1 | 1/0 - 6/1 |
| 4 - 7/1 | 2/0 - 6/1 |
| 2 - 6/1 | 3/0 - 6/1 |
| 2 - 7/1 | 4/0 - 6/1 |
| 1/0 - 6/1 | 266.8 kcmil - 26/7 |
| 2/0 - 6/1 | 336.4 kcmil - 26/7 |
| 3/0 - 6/1 | 477 kcmil - 26/7 |
| 4/0 - 6/1 | 556.5 kcmil - 26/7 |
| 266.8 kcmil 18/1 | 795 kcmil - 26/7 |
| 336.4 kcmil 18/1 | 954 kcmil - 54/7 |
| 477 kcmil 18/1 | |

NOTE: Larger sizes may be used where the engineer's study shows they are required.

The following manufacturers have shown compliance with the applicable specifications:

Alcan Cable
Conductores Monterrey S.A. de C.V.
Condumex
General Cable
Nehring
Nexans Canada
Nexans Korea
Noranda
Pirelli Cable
Southwire
Taihan Electric Wire

NOTES

1. Conductors with 18/1 stranding have different sag characteristics than conductors with 6/1 or 26/7 stranding. This difference in sag characteristics must be taken into consideration in the line design.
2. 266.8 kcmil 26/7, 336.4 kcmil 26/7, and 477 kcmil 26/7 may be used for distribution underbuild on transmission lines.

be - Recloser, vacuum interruption with solid dielectric

| Manufacturer | Conditions |
|---|-----------------------|
| <u>ABB</u> Three phase, Type OVR electronically controlled, vacuum interruption, solid dielectric, 630 amps maximum continuous, 12500 amps RMS symmetrical interruption, 15.5 kV maximum for 12.5/7.2 kV, 27 kV maximum for 24.9/14.4 kV. | To obtain experience. |
| <u>Cooper Power Systems</u> Three phase, Type NOVA electronically controlled, vacuum interruption, solid dielectric, 560 amps maximum continuous, 12000 amps RMS symmetrical interruption, 15.5 kV maximum for 12.5/7.2 kV, 27 kV maximum for 24.9/14.4 kV. | To obtain experience. |
| Single Phase, Type NOVA electronically controlled, vacuum interruption, solid dielectric, 400 amps maximum continuous, 8000 amps RMS symmetrical interruption, or 800 amps maximum continuous, 12500 amps RMS symmetrical interruption 15.5 kV maximum for 12.5/7.2 kV, 29.2 kV maximum for 24.9/14.4 kV. | To obtain experience. |
| Three phase, Type NOVA-TS Triple-Single electronically controlled, vacuum interruption, solid dielectric, 400 amps maximum continuous, 12500 amps RMS symmetrical interruption, 15.5 kV maximum for 12.5/7.2 kV, 29.2 kV maximum for 24.9/14.4 kV. | To obtain experience. |
| <u>G & W Electric Company</u> Three phase, electronic, VIPER Series, vacuum interruption, solid dielectric, 800 amps maximum continuous, 12,500 amps RMS symmetrical interruption, 15.5 kV maximum for 12.5/7.2 kV, 27 kV maximum for 24.9/14.4 kV. | To obtain experience. |

NOTES:

1. Series trip reclosers with ratings greater than 100 amp for 12.5/7.2 kV application, greater than 200 amp for 24.9/14.4 kV application, and 280 amp for 34.5/19.9 kV application are acceptable only with ground trip device. Shunt trip reclosers without ground trip devices may not be used with trip settings higher than 200 amp for 12.5/7.2 kV application, greater than 400 amp for 24.9/14.4 kV application, and 560 amp for 34.5/19.9 kV application.
2. Reclosers are not acceptable with load current, bushing CT battery chargers.

Conditional List
be(4.1)
July 2004

be - Recloser, vacuum interruption with solid dielectric

| Manufacturer | Conditions |
|--|-----------------------|
| <u>Joslyn Hi-Voltage</u> Three-phase, Type TRIMOD 300 series, vacuum interruption, solid dielectric foam, 560 amps maximum continuous, 12000 amps RMS symmetrical interruption, 15.5 kV maximum for 12.5/7.2 kV, 27 kV maximum for 24.9/14.4 kV | To obtain experience. |
| Single-phase, Type TRIMOD 100 series, vacuum interruption, solid dielectric foam, 560 amps maximum continuous, 12500 amps RMS symmetrical interruption, 17.1 kV maximum for 12.5/7.2 kV, 29.3 kV maximum for 24.9/14.4 kV | To obtain experience. |

NOTES:

1. Series trip reclosers with ratings greater than 100 amp for 12.5/7.2 kV application, greater than 200 amp for 24.9/14.4 kV application, and 280 amp for 34.5/19.9 kV application are acceptable only with ground trip device. Shunt trip reclosers without ground trip devices may not be used with trip settings higher than 200 amp for 12.5/7.2 kV application, greater than 400 amp for 24.9/14.4 kV application, and 560 amp for 34.5/19.9 kV application.
2. Reclosers are not acceptable with load current, bushing CT battery chargers.

cg - Switch, three-pole, group-operated
(Factory Preassembled)

| Manufacturer | Acceptable Mounting on Structures | Vertical Break | | Side Break | |
|--|-----------------------------------|----------------|---------------|--------------|-------|
| | | Type | kV | Type | kV |
| ABB | Horizontal (A) | | | SLB-3(L) | 15-25 |
| Bridges Electric [#] | Horizontal (A) | | | Vector(L) | 15-27 |
| | Phase over phase (A) | | | Vector(L) | 15-27 |
| | Vertical (A) | | | Vector(L) | 15-27 |
| [#] Both operating shaft and hookstick versions of switch accepted. | | | | | |
| Cooper Power Systems (Kearney) | Horizontal (A) | | | M-FORCE | 15-35 |
| | Phase over phase (A) | | | M-FORCE | 15-35 |
| | Vertical (A) | | | M-FORCE | 15-35 |
| Hubbell (Chance) | Horizontal (A) | | | D7(L) | 15-27 |
| | Phase over phase (A) | | | D7(L) | 15-27 |
| | Vertical (A) | | | D7(L) | 15-27 |
| | Horizontal (B) | | | D7(L) | 34.5 |
| | Phase over phase (B) | | | D7(L) | 34.5 |
| | Vertical (B) | | | D7(L) | 34.5 |
| Inertia Engineering | Horizontal (A) | | | LBS(L) | 15-35 |
| | Vertical (A) | | | LBS(L) | 15-35 |
| | Phase over phase (A) | | | LBS(L) | 15-35 |
| S&C* | Horizontal (A) | | | Alduti(L) | 15-25 |
| | | | | Alduti(L) | 34.5 |
| | | | | (200 kV BIL) | |
| | Phase over phase (A) | | | Alduti(L) | 25 |
| | | | | Alduti(L) | 34.5 |
| | | | | (200 kV BIL) | |
| | Vertical (A) | | | Alduti(L) | 15-25 |
| | | | | Alduti(L) | 34.5 |
| | | | | (200 kV BIL) | |
| | Phase over phase (B) | | Alduti(L)34.5 | Alduti(L) | 34.5 |
| | Vertical (B) | | Alduti(L)34.5 | | |

(L) Means gas or solid material full-load interrupters are accepted and available.

(A) Not suitable for substation use.

(B) For station and transmission use only. The steel crossarm base must be grounded with an adequate grounding connector. 200 kV BIL only.

NOTE: Switches with factory-assembled crossarm type bases for distribution lines must have non-conducting crossarm type bases, non-conducting braces, and insulated interphase and control rods, except as otherwise noted.

* Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators through 34.5 kV on request.

Conditional List
cg(1)
July 2004

cg - Switch, air, three-pole, group operated

| Manufacturer | Conditions |
|--|--|
| <u>Cleaveland/Price</u> Type V2-C (15-69 kV) Vertical break, horizontal or vertical mounting Type RL-C (15-69 kV) Single side break, horizontal or vertical mounting | 1. To obtain experience. 2. Insulated interphase and control rods required on wood distribution structures. |
| <u>G & W Electric Company</u> Type MK-40A 15 kV through 345 kV(horizontal upright mounting) | 1. To obtain experience. 2. Insulated interphase and control rods required on 15 kV and 23 kV models used on wood structures. 3. Steel interphase base required when mounted as in RUS Drawing TM-3. |
| Type LPV, 3-pole 72.5-272 kV, 1200 amp., 1600 amp., 2000 amp., center sidebreak for horizontal mounting. | To obtain experience. |
| <u>Hubbell (Chance)</u> Type AR Side-break, horizontal phase-over-phase, and vertical mounting, with non-conducting crossarm type base and insulated interphase and control rods, 15, 25 and 34.5 kV(grounded wye) | To obtain experience. |

(L) Means full-load interrupter accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

cm – Insulators, spool (Polymer)

| Manufacturer | Conditions |
|--|-----------------------|
| Hubbell (Chance) C909-1032P (ANSI Class 53-2) | To obtain experience. |

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gj - Crossarm Assemblies and Arm Spacers

Distribution

Wood crossarm assembly complete with braces and attaching hardware, fittings and bolts

Crossarm Assembly

| <u>Manufacturer</u> | <u>Crossarm Size</u> | <u>Catalog No.</u> |
|---------------------|--------------------------|--------------------|
| Brooks | 3-1/2" x 4-1/2" x 8'-0" | 3103-A8 |
| | 3-3/4" x 5-3/4" x 8'-0" | 3103-C8 |
| | 3-3/4" x 7-3/4" x 8'-0" | 3203-A8 |
| | 3-3/4" x 7-3/4" x 10'-0" | 3203-A10 |
| Hughes Brothers | 3-1/2" x 4-1/2" x 8'-0" | 2890A |
| | 3-3/4" x 5-3/4" x 8'-0" | 2890B |
| | 3-3/4" x 7-3/4" x 8'-0" | 2892-A |
| | 3-3/4" x 7-3/4" x 10'-0" | 2892-B |
| Pennington | 3-1/2" x 4-1/2" x 8'-0" | C500B |
| | 3-3/4" x 5-3/4" x 8'-0" | C500F |
| | 3-3/4" x 7-3/4" x 8'-0" | C500M |

Twin Arm Spacer*

To be used with standard hardware, 3-5/8" x 4-5/8" x 8'-0" crossarm, and 28" wood braces

Line Hardware CAS-455

*Restricted to applications where the conductor's maximum design tension is less than 1250 lbs. and to conductor sizes 1/0 ACSR and below.

gj - Crossarm Assemblies

Braceless, wood

| Manufacturer | Conditions |
|--------------|------------|
|--------------|------------|

Aluma-Form

| | |
|---------------------|-----------------------|
| HD-DEA-86-EB-REA | To obtain experience. |
| HD-2-DEA-86-EB-REA | |
| HD-DEA-108-EB-REA | |
| HD-2-DEA-108-EB-REA | |

Hughes Brothers

| | |
|-----------|-----------------------|
| 3377-A7.5 | To obtain experience. |
| 3377-A8.5 | |
| 3377-A9.5 | |

Braceless, fiberglass

Geotek (PUI)

| | |
|------------|-----------------------|
| DA2500-96 | To obtain experience. |
| DA2500-120 | |
| DA3000-96 | |
| DA3000-120 | |

MacLean Power Systems

| | |
|--------|-----------------------|
| PZ08LD | To obtain experience. |
| PZ10LD | |
| PY08SD | |
| PY10SD | |

Powertrusion

| | |
|--------------|-----------------------|
| PSD082A1FRUS | To obtain experience. |
| PSD102A1FRUS | |
| PHD082A1FRUS | |
| PHD102A1FRUS | |

Shakespeare

| | |
|----------------------|-----------------------|
| IDB096N1224(X)RUS** | To obtain experience. |
| XDB096N1224(X)RUS** | |
| HDB096N1224(X)RUS** | |
| IDB120N1224(X)RUS** | |
| XDB120N1224(X)RUS** | |
| (**X=2-Gray Color | |
| 5-Dark Bronze Color) | |

rp - Wildlife Guards

Bushings and Live Parts Covers

| <u>Manufacturer</u> | <u>Conditions</u> |
|--|-----------------------|
| <u>Chris Kaye (Crittter Guard)</u> 201 - "L" Bracket 202 – Roller 203 - Wheel | To obtain experience. |
| <u>Hendrix Wire & Cable</u> Catalog No. BG-9 | To obtain experience. |
| <u>Hendrix (Eco Electrical Systems, Inc.)</u> EICG-1 EICG-1-WLPT EICG-1-20 EICG-1-32 | To obtain experience. |
| <u>Kaddas Enterprises Inc.</u> KE1045A* birdguard KE1066* arrester cap KE1077* transformer bushing cover KE1053* arrester cap KE1064* transformer bushing cover KE 1049* birdguard | To obtain experience. |
| <u>Tripp (Eco Electrical Systems, Inc.)</u> ECC-1 ECC-2-27-150BIL-S&C-Version 10 ECC-3-27-150BIL-S&C-Version 9 ECC-4-27-125BIL-S&C-Kearney HX ECC-5-ABB-LBU | To obtain experience. |

NOTE: The material composition of these items does not contain a flame-retardant unless specified by the manufacturer.

*Specified by manufacturer as being flame-retardant

Anti-Perch Devices

| <u>Manufacturer</u> | <u>Conditions</u> |
|---|----------------------|
| <u>Hendrix Wire & Cable</u> Catalog No. HPP-24 | To obtain experience |

NOTE: The material composition of these items does not contain a flame-retardant unless specified by the manufacturer.

sb - Switch, disconnect (single-pole, hook operated station class)

NEMA standard switches for station or line structure use where single-pole switching is permissible

| Manufacturer | Type | Voltage Ratings | System Voltages Line to Line |
|------------------------------|------------|-----------------|---------------------------------|
| ABB | HPL | 15 thru 69 kV | 12.5 thru 69 kV |
| Bridges | EH | 15 thru 69 kV | 12.5 thru 69 kV |
| | EHL(L) | 15 thru 34.5 kV | 12.5 thru 34.5 kV |
| Cleaveland/Price | LCO-C | 15 thru 69 kV | 12.5 thru 69 kV |
| Cooper Power Systems | D2(PL) | 15 and 23 kV | 12.5 thru 24.9 kV |
| G & W Electric | B-2M | 15 thru 69 kV | 12.5 thru 69 kV |
| | EV(PL) | 15 thru 34.5 kV | 12.5 thru 34.5 kV |
| Hubbell (Chance) | M3(PL) | 15 thru 27 kV | 12.5 thru 24.9 kV |
| Johnson | HPT | 15 thru 69 kV | 12.5 thru 69 kV |
| Joslyn (Hi-Voltage) | HU | 15 thru 34.5 kV | 12.5 thru 34.5 kV |
| | HI | 15 thru 34.5 kV | 12.5 thru 34.5 kV |
| Kearney/Cooper Power Systems | M-72(PL) | 15 thru 69 kV | 12.5 thru 69 kV |
| | H-72 | 15 thru 34.5 kV | 12.5 thru 34.5 kV |
| MEMCO | STV | 15 thru 69 kV | 12.5 thru 69 kV |
| | STU | 15 thru 69 kV | 12.5 thru 69 kV |
| Morgan | DHS(PL) | 15 thru 69 kV | 12.5 thru 69 kV |
| Royal Switchgear | BT | 15 thru 69 kV | 12.5 thru 69 kV |
| | BLT(PL) | 15 and 23 kV | 12.5 thru 24.9 kV |
| S & C* | LBD(PL) | 15 thru 34.5 kV | 12.5 thru 34.5 kV |
| | Alduti (L) | 15 and 25 kV | 12.5 thru 24.9 kV |

(L) Means solid material load interrupters are available and accepted.

(LV) Means vacuum interrupters are available and accepted.

(PL) Means hooks for portable load interrupters are available for voltages 34.5 kV and below. Consult switch manufacturer concerning loop switching applications at higher voltages.

*Available with porcelain insulators. Available with "Cypoxy" cycloaliphatic epoxy insulators through 34.5 kV on request.

sd - Current Transformers
Outdoor Type

| Manufacturer | .6 kV | 15 kV | 25 kV | 34.5 kV | 69 kV |
|--|----------------------------------|----------------------------|---------------------------------|---------------------------------|-----------------------------|
| ABB | CSF/CMS CMF CLC/CLE | KOR-11 KON-11 KOT-11 | ICT-150 KOR-I5 KOT-I5 | ICT-200 KOR-20 - | ICT-350 - - |
| Andover | DCBW DCCW DCAB | - - - | - - - | - - - | - - - |
| G.E.C. Durham Industries (Astra) | AA&TA AB AD&AC | - - - | - - - | - - - | - - - |
| Electromagnetic Industries (Square D) | | CO3-110 | CO3-150 | CO3-200 | IK-350 |
| General Electric | JCR-0 JCW-0 JAK-0 JAD-0 | JKW-5 JCK-5 - - | JKW-6 JKW-150 KG-150 - | JKW-7 JKW-200 KG-200 - | JKW-350 KG-350 - - |
| Kuhlman Electric | | BB-15-971 BB-15-972 | BB-25-973 BB-25-974 | BB-34-975 BB-34-976 | COF-350 - |
| Schlumberger | R6S R6SA R6M R6L | - - - - | - - - - | - - - - | - - - - |

NOTE: The transformer types listed above are accepted in all standard ratios. Insulation class, voltages, ratios and other necessary information should be specified when ordering.

sd - Current Transformers
Outdoor Types

| Manufacturer | Conditions |
|--|-----------------------|
| <u>Electromagnetic Ind. (Square D)</u> Type UMCT, 0.6 kV Type UCT, 0.6 kV Type IK 4-350-69, 69 kV (cycloaliphatic resin bushings) | To obtain experience. |
| <u>Ritz Instrument Transformers, Inc.</u> GIFU 15-01; 0.3 B0.1-1.8, 15kV GIFU 15-01; 0.3 B0.1-0.5, 15kV GIFU 25-01; 0.3 B0.1-0.9, 25kV GIFU 25-01; 0.3 B0.1-2.0, 25kV GIFS 36-55; 0.3 B0.1-0.9, 34.5kV GIF 36-69; 0.3 B0.1-2.0, 34.5kV GIF 72.5-68; 0.3 B0.1-2.0, 69 kV | To obtain experience. |

se - Voltage Transformers

| <u>Outdoor Types</u> | | | | | |
|--|-------|-------------|---------|---------|-----------|
| Manufacturer | .6 kV | 15 kV | 25 kV | 34.5 kV | 69 kV |
| ABB | PPM | VOG-II | LPT-I50 | LPT-200 | LPT-350 |
| | - | VOY-II | VOG-I5 | VOG-20 | - |
| | - | VOZ-II | VOZ-I5 | VOZ-20 | - |
| Andover | DVE-6 | - | - | - | - |
| | DVF-6 | - | - | - | - |
| Electromagnetic Industries (Square D) | | PO5-110 | PO5-150 | PO5-200 | U3-350-69 |
| General Electric | JVA-0 | JVW-5 | JVW-6 | JVW-7 | ET-350 |
| | JVP-0 | JVW-110 | - | - | JVT-350 |
| | - | - | JVT-150 | JVT-200 | - |
| Kuhlman Electric | - | PTT-110-977 | - | - | POF-350 |
| Schlumberger | T5R | - | - | - | - |
| | T6R | - | - | - | - |
| | T7R | - | - | - | - |

NOTE: The transformer types listed above are acceptable in all standard ratios. Insulation class, voltages, ratios and other necessary information should be specified when ordering.

se - Voltage Transformers

Outdoor Types

| Manufacturer | Conditions |
|--|-----------------------|
| <u>G.E.C. Durham Industries (Astra)</u> Type DB, 0.6 kV Type DA, 0.6 kV Type DF, 0.6 kV | To obtain experience. |
| <u>Electromagnetic Industries (Square D)</u> Type U-450, 0.6 kV Type U-4-350-69, 69 kV (cycloaliphatic resin bushings) | To obtain experience. |
| <u>Ritz Instrument Transformers, Inc.</u> VZF 15-20; 2 Bushing 0.3WXYZ, 15 kV VZF 15-10; 2 Bushing 0.3WXY, 15 kV VEF 15-10; 1 Bushing 0.3WXY, 15 kV VEF 15-20; 1 Bushing 0.3WXYZ, 15 kV VZF 25-10; 2 Bushing 0.3WXYZ, 25 kV VEF 25-10; 1 Bushing 0.3WXYZ, 25 kV VZF 36-10; 2 Bushing 0.3WXY, 34.5 kV VEF 36-10; 1 Bushing 0.3WXY, 34.5 kV VEF 72-03; 1 Bushing 0.3WXYZ, 69 kV | To obtain experience. |

U ae - Arresters, Surge
(For Underground System Pole Risers)

CONDITION OF ACCEPTANCE: To Obtain Experience

| Manufacturer | Type | MOV Type | | Manufacturer' Classification | Housing |
|---------------------------------|-----------------------|--------------------------|--------|---------------------------------|-----------|
| | | Accepted Ratings - kV | Duty | | |
| ABB | HMX | 9,10,18 | Heavy | Intermediate * | Polymer |
| | RMX | 9,10,18 | | | |
| | XPR | 9,10,18,27 | Heavy | | |
| Cooper | CPS AZR VariSTAR | 9,10,18,27 | Heavy | Distribution | Porcelain |
| | URS UltraSIL VariSTAR | 9,10,18,27 | Heavy | Distribution | Polymer |
| General Electric | Tranquell ** U.D. II | 9,10,18,27 | Normal | Distribution | Porcelain |
| | Tranquell | 9,10,18,27 | Normal | Intermediate | Porcelain |
| Hubbell (Ohio Brass) | DynaVar-PVR | 9,10,18,27 | Heavy | Riser Pole | Polymer |
| Joslyn | ZRP | 9,10,18,27 | Heavy | Distribution | Polymer |
| Kearney/Cooper Power Systems | Univar SGR | 9,10,18,27 | Normal | Riser Pole | Porcelain |

*Has intermediate class arrester characteristics but does not have intermediate class venting capability.

**A non fragmenting U.D. II Arrester is available for 9 & 10 kV designs at higher cost when specified.

Conditional List

U ae(2.1)

July 2004

U ae - Arresters, Surge
(For Underground System Pole Risers)

CONDITION OF ACCEPTANCE: To Obtain Experience

MOV Type (Internally Gapped)

| Manufacturer | Type | Accepted Ratings - kV | Duty | Manufacturer's Classification | Housing |
|--------------|----------------|--------------------------|-------|----------------------------------|-----------|
| Cooper | AZR500 VariGap | 9,10,18,27 | Heavy | Distribution | Porcelain |
| | URG UltraSIL | 9,10,18,27 | Heavy | Distribution | Polymer |
| | VariGap | | | | |

U fw - Secondary Tap Connector

| Manufacturer | Type or Catalog No. |
|----------------|------------------------|
| Tyco (Raychem) | Compression Connectors |
| | CRSM-CT-34/10-150 |
| | CRSM-CT-53/13-200 |
| | CRSM-CT-84/20-250 |
| | Standard Split Bolt |
| | CRSM-CT-53/13-200 |

U fz - Transformer Connector Block, Insulated
Multiple Cable Connectors

Watertight - For use in all locations

| Manufacturer | Connection Type | Catalog Number |
|--------------|-----------------|--|
| Blackburn | Lug | SCU, with lugs and sleeves |
| Burndy | Lug | Stud Mole with sealing sleeve |
| Utilco | Set Screw | PTF-SS, Watertight Insulated transformer Connector block |

Non-Watertight - For use in above grade locations only

| | | |
|-------------------------|-----------|---|
| Alcoa | Lug | Interchange 1 ABBD Series (Disconnectable) Use with A9 insulating boots |
| Alcon | Set Screw | VBTT Series with double sealing sleeve |
| Blackburn | Set Screw | TSB-J58C (Permanent) |
| | Set Screw | TSB-D58C (Disconnectable) |
| Burndy | Set Screw | K-D Series (Disconnectable) K-DF Series (Permanent) |
| Connector Mfg. Co. | Set Screw | Uni-Joint Bar Connectors, (Series RLS, NSM- C, NDS-C, NSC, ZS-C, ZSU-C, RLUS) (Permanent) |
| | Set Screw | Uni-Joint Bar Connectors, (Series RLSS, NSSM-C, NSSC, ZQC, ZQU-C, RLUS) (Disconnectable) |
| ESP | Lug | Types SUR and RDSR(Removable) (With Types LA and AL-lugs and Sleeve kits) |
| | Set Screw | Type UPSO-I (Permanent) Type UPM-I (Disconnectable) |
| Homac | Lug | DF Series |
| | Lug | FTU 125 Series(Disconnectable) with flood seal sleeve kit |
| | Set Screw | LRT Series |
| Hubbell (Fargo) | Bolted | GUC Series |
| | Set Screw | GUS-460S Series |
| MacLean (Reliable) | Set Screw | 15912-REA (Disconnectable) |
| Penn Union | Lug | Type DBAT (Permanent) |
| | Lug | Type DBAT-LH (Disconnectable) Use with Series DBTB, DBTBF and DBTH lug and Sleeves kits |
| Preformed | Set Screw | SC-C series (Permanent) |
| | Set Screw | CSC-Q-C Series, SC-Q-C series (Disconnectable) |
| Utilco | Set Screw | PTF-IN (Permanent) |
| | Set Screw | PTF-CJNU, PSS Series (Disconnectable) |
| Vector Connectors Corp. | Set Screw | TQL Series (Disconnectable) (with insulating boot) |

Note: Additional insulation may be required with some of the above-listed secondary terminal blocks due to the irregularity of mating surfaces between various secondary studs being supplied by the transformer manufacturers.

U gc - Shield, cable riser

| Manufacturer | Dia. (Inches) | Length (Feet) |
|--|---|----------------|
| <u>Galvanized Steel</u> | | |
| Almat Metal Limited | 2 1/4 | 8 |
| Electrical Materials | 2 - 3 - 4 - 5* | 5* |
| Hubbell (Chance) | 2 - 3 - 3 1/2 | 5 - 9 |
| Joslyn | 2 - 3 - 3 1/2* | 5 - 8* |
| Midland-Ross (Kindorf Snapduct) | 2 1/2 - 3 1/2 - 5 (14 ga. galv. steel) | 2 1/2 - 5 - 10 |
| <u>Plastic and Fiberglass</u> | | |
| Applied Extrusion Technologies (plastic) (Power Mold, I, II, III) | 2 - 3 - 4 - 5 - 6* | 5 - 8 - 10* |
| Carlton | 2 - 3 - 4 - 5 - 6* | 10* |
| Custom Plastics | 2 - 3 - 4 - 5* | 5 - 10* |
| Electrical Materials (plastic) | 1 - 2 - 3 - 4 - 5 - 6* | 5 - 8 - 10* |
| Joslyn (plastic) | 2* | 10* |
| Nordic (fiberglass) | 2 - 3 - 5* | 5 - 10* |

(Order by size and length)

*All sizes available with back plate.

Full Round**

| | | |
|--|---------------|----|
| Smith Fiberglass Products (standard wall) | 2 - 3 - 4 - 5 | 30 |
|--|---------------|----|

**Full round riser shield is to be mounted directly to the surface of the pole with no standoffs.

U gk - Terminations, Indoor

(When ordering specify conductor size, type, whether
copper or aluminum and insulation diameter)

| <u>Manufacturer</u> | <u>Catalog No.</u> |
|---------------------|--------------------|
|---------------------|--------------------|

PREMOLEDDED

| | |
|-----------------------------|---|
| <u>Cooper Power Systems</u> | Fasterm Stress Cone (15 & 25 kV) |
| <u>Elastimold (ESNA)</u> | Style 35-MSD (15, 25 & 35 kV) |
| <u>Hubbell (Chardon)</u> | Termi-Matic, Type A or G (15, 25 & 35 kV) |

HEAT SHRINK

| | |
|-----------------------|--|
| <u>DSG-Canusa</u> | CT Series (15kV, 25kV, 35kV) |
| <u>G&W</u> | ESTS15_PLA (15 kV) ESTS25_PLA (25 kV) |
| <u>Hellermann</u> | MVTS15_PLA (15 kV) MVTS25_PLA (25 kV) |
| <u>Tyco (Raychem)</u> | HVT (15, 25 & 35 kV) |

COLD SHRINK

| | |
|-----------------------|--|
| <u>3M</u> | QT III Series (15 kV) Quick Term II Series (25 & 35 kV) |
| <u>Joslyn</u> | JIPT Series (15, 25 kV) JPT Series (25 kV) |
| <u>Tyco (Raychem)</u> | TFT Series (15, 25, 35 kV) |

INSULATED WRAP

| | |
|------------------------|------------------------------|
| <u>Plymouth/Bishop</u> | Stress-Wrap (15, 25 & 35 kV) |
|------------------------|------------------------------|

U gk - Terminations, outdoor
(with mounting hardware)*

(When ordering, specify conductor size, type, whether
copper or aluminum, insulation diameter, and type of
mounting desired)

| Manufacturer | Catalog Number |
|-----------------------------|--|
| <u>POLYMER</u> | |
| <u>PREMOLEDDED</u> | |
| <u>Cooper Power Systems</u> | Fasterm Series (15 & 25 kV) |
| <u>Elastimold (ESNA)</u> | Style 16-THG (15 and 25 kV) (for bare concentric neutral cable) Style 35-MT (35 kV) (for bare concentric neutral cable) Style PCT-1 (15 kV) (for jacketed cable) Style PCT-2 (25 kV) (for jacketed cable) |
| <u>Hubbell (Chardon)</u> | Termi-Matic, Type G (15, 25 and 35 kV) |
| <u>HEAT SHRINK</u> | |
| <u>DSG-Canusa</u> | CT Series (15kV, 25kV, 35kV) |
| <u>G&W</u> | ESTS15_PLO (15 kV) ESTS25_PLO (25 kV) |
| <u>Hellermann</u> | MVTS15_PLO (15 kV) MVTS25_PLO (25 kV) |
| <u>Plymouth/Bishop</u> | SWO Kit (15, 25 and 35 kV) |
| <u>Tyco (Raychem)</u> | HVT (15, 25 and 35 kV) |
| <u>COLD SHRINK</u> | |
| <u>Joslyn</u> | JPT Series (15, 25, 35 kV) |
| <u>Tyco (Raychem)</u> | TFT Series (15, 25, 35 kV) |
| <u>3M</u> | QT III Series (15, 25, & 35 kV) |
| <u>PORCELAIN</u> | |
| <u>G & W</u> | "Eliminator" 15 kV, E 25 kV, E 35 kV, E |
| <u>Joslyn</u> | "Easy-On II" (15, 25 and 35 kV) |

*Mounting Hardware is used to attach termination to mounting bracket (U hd or U hj).
NOTE: Some of the above terminators may require ordering the mounting hardware separately.

U gn-1
July 2004

U gn - Enclosures, equipment

Applicable Specifications: "RUS Specifications for Equipment Enclosures," U-4

| <u>Manufacturer</u> | <u>Catalog No.</u> |
|------------------------|--|
| <u>Durham</u> | AT-42 Series (dead-front) AT-54 Series (dead-front) |
| <u>Elliott</u> | EPM-PTS (dead-front) |
| <u>Malton Electric</u> | ME Series (dead-front) MEV Series (dead-front) |
| <u>Maysteel</u> | EL100 (dead-front) |
| <u>Nordic</u> | ND-28 and ND-33 |

NOTE:

1. The above enclosures are available with various multipoint terminations. The owner should specify termination points to be provided.
2. These enclosures have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.

U gn - Enclosures, Equipment

Sectionalizing Enclosures

| <u>Manufacturer</u> | <u>Catalog No.</u> |
|-------------------------------|--|
| <u>Cooper Power Systems</u> | SecTER Series I and II (Single-Phase and Three-Phase) |
| <u>Durham</u> | AMSP() Series |
| <u>Fiberglass Fabricators</u> | FSC-32 Single Phase FSC-62 Three Phase |
| <u>Malton Electric</u> | ME Series MEH Series |
| <u>Maysteel</u> | CW200 Series CW300 Series |
| <u>Nordic</u> | ND-20, ND-36, ND-40, ND-55, ND-68 |
| <u>Power Design Inc.</u> | Type CJP series, single-phase and three-phase, 15 and 25 kV |
| <u>Rough Rider Industries</u> | Series RUF93 |
| <u>Shallbetter</u> | SPMS Series (dead-front) |

NOTE:

1. The above enclosures are available with various multipoint terminations. The owner should specify termination points to be provided.
2. These enclosures have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.

U go - Fault Indicator
(For Construction Unit UM 6-4)

| Manufacturer | Type |
|----------------------------|---|
| Cooper Power Systems | S.T.A.R. CR, DR, ER, MR, TPR |
| Edison Control Corporation | Series EC100 (single phase) Series EC300 (three phase) (Available with mounting kit KT5002) |
| Fisher Pierce | Series 1514 (current reset, single-phase) Series 1515 (current reset, three-phase) Series 1541 (time reset, single-phase) Series 1543 (time reset, three-phase) Series 1547 (adaptive trip) |
| Horstmann GmbH | FCI-LT Series Time Reset 29-3014 (.85 to 1.57 inch) 29-3015 (1.57 to 2.37 inch) Current Reset 29-3114 (.85 to 1.57 inch) 29-3115 (1.57 to 2.37 inch) |

Note: Fault indicators that require the drilling or cutting to the enclosure for mounting are not acceptable.

U gq - Boot or sleeve, insulated*

| Manufacturer | Catalog Number |
|----------------------|---|
| Blackburn | MPC9 MPC15 |
| Electrical Materials | 100-B (For pad-mounted transformer spade terminals) |

*Use restricted to 120/208 volt 500 kVA transformers and larger not equipped with threaded studs.

U gu-1
January 2005

U gu - Pedestal, Power
(Above-Grade)
Refer to Construction Drawing UK5

Applicable Specifications: "RUS Specifications for Secondary Power Pedestals," U-6

| Manufacturer | Inside Dimensions Inches | Height Inches | Catalog No. |
|---|-----------------------------|------------------|--------------------------|
| <u>API</u> | 6X6 | 32 | API 6X6 |
| | 9X10 | 25-1/2 | API 9 X 10 |
| | 10X11 | 34 | API 10 X 11 |
| | 10X11 | 12-1/4 | API 10 X FM |
| | 10X11 | 72 | API 10X11XL |
| | 10X14 | 22-1/2 | API 10 X 14 |
| | 10X14 | 26-1/2 | API 10 X 14 WB |
| | 16X28 | 38 | API 16X28 |
| | 13 Dia. | 25 | API 176 |
| <u>Coil Sales</u> (Charles Industries) | 8.25 Dia | 31-1/2 | CPLP-8 |
| | 8.25 Dia | 31-1/2 | CPLP-8I(Integral Stake) |
| | 10.75 Dia | 31-1/2 | CPLP-10 |
| | 10.75 Dia | 31-1/2 | CPLP-10I(Integral Stake) |
| <u>Electrimold</u> | 14.5 x 19.5 | 31.5 | EFSO-111630 |
| <u>Fiberglas Fabricators</u> | 14 X 9 | 31 | FFSP Series |
| | 15.5 X 15.5 | 30 | FFSP Series |
| | 15.5 X 15.5 | 36 | FFSP Series |
| | 14 X 9 | 42 | FFSP Series |
| | 9 X 9 | 31 | FFSP Series |
| <u>MacLean (Reliable)</u> | 8 x 8 | 38 | UP 8HLP |
| | 8 x 8 | 46 | UP 8HP |
| | 10-1/2 x 10-1/2 | 26 | UP 10HLP |
| | 16-1/2 x 10-1/2 | 36 | UP 1016HLP |
| | 10-1/2 x 10-1/2 | 42 | UP 10HP |
| <u>Nordic</u> | 8 x 8 | 44 | PR-50, PR-55 |
| | 9 x 14 | 30 | PR-149 (stake) |
| | | | PR-150 (stakeless) |
| | 9 x 14 | 30 | PRMC 150 (low profile) |
| | 9 x 14 | 24 | PRMC-160 |
| | 9 x 14 | 30 | PRMC-170 (high profile) |
| | 9 x 14 | 36 | PRMC-190 |
| | 9 X 13 | 30 | PSP-91330 |
| | 10 X 15 | 38 | PSPF-101538 |
| | 15 X 15 | 30 | PSP-151530 |
| | 21 X 21 | 15 | PHH-212115 |
| | 16 X 19 | 12 | PHH-161912 |
| <u>PenCell</u> | 11X14 | 37 | AG-15 |

U gu - Power Pedestal
(Below-Grade)
Refer to Drawings UK6

Applicable Specifications: "RUS Specifications for Secondary Power Pedestals," U-6

| <u>Manufacturer</u> | <u>Catalog No.</u> |
|-----------------------------------|--|
| <u>Malton</u> | Fiberglass secondary pedestal FSP31139, FSP301515 |
| <u>Pen-Cell</u> | PE Series-High Density Polyethylene (HDPE) base;lid available in HDPE, fiberglass, aluminum, or stainless steel;PEM Series with modular construction |
| <u>Quazite</u> | Power Pedestal – PV, Boxes - PX/PE Series, PR/LR Series, PC, PG, LG Series |
| <u>Synertech Moulded Products</u> | S1212, S1118, S1324, S1730, S2436, S3048 and S3660 |
| <u>Thermodynamics</u> | PP-91 and PPV-91 Series |

U gv-1
July 2004

U gv - Stake, Power Pedestal
Refer to Construction Drawing UK5

| Manufacturer | Length Inches | <u>Catalog No.</u> | |
|--------------------|---------------|-------------------------|--------------------|
| | | For Power Pedestal Only | For Joint Pedestal |
| Hubbell (Fargo) | 42-60-72-78 | UP-530S Series | UP-530J Series |
| MacLean (Reliable) | 72-78-84 | DM Series | DM Series |

U hf - Jacketed Cable Restoration Kits
(For resealing concentric neutral wires after installation of splices in jacketed underground cable)

(When ordering, specify diameter of cable over jacket)

| Manufacturer | Conditions |
|--|-----------------------|
| <u>Elastimold</u> PCS-1 Power Cable Seal | To obtain experience. |
| <u>Homac</u> CNC Series Concentric Neutral Cover | To obtain experience. |
| <u>Joslyn</u> Shrinklite JRS Series | To obtain experience |
| <u>Raychem</u> WCSM (Tubing Type) MWTM (Tubing Type) CRSM (Wraparound Type) | To obtain experience. |
| <u>3M</u> HSJ Series (Heat Shrink) SJ Series (Cold Shrink) | To obtain experience. |

Conditional List

U hf(2)

July 2004

U hf - Terminator Sealing Kits

(For resealing concentric neutral wires after installation of elbows or outdoor terminations on jacketed underground cable.)

(When ordering, specify diameter of cable over jacket.)

| Manufacturer | Conditions |
|--|-----------------------|
| <u>Cooper Power Systems</u> JS200 Elastic Seal | To obtain experience. |
| <u>Elastimold</u> 200 ECS Elbow Cable Shield, Cold Shrink | To obtain experience. |
| <u>Homac</u> CNC Series Concentric Neutral Cover | To obtain experience. |
| <u>Raychem</u> ESA, Heat Shrink | To obtain experience. |
| <u>3M</u> 8450 Series, Cold Shrink | To obtain experience. |

U hr - Secondary tap or splice cover, submersible

| Manufacturer | Type or Catalog No. |
|------------------------------|--|
| Blackburn | Type WDBS (#2 through #4/0), Type DBS (250 kcmil through 1000 kcmil) |
| Connector Mfg. Co. | Utilug Sure Seal |
| Elastimold (ESNA) | Style 86 |
| ESP | TSC Series |
| Homac | FSS Series |
| Joslyn | Shrinktite JCLS Series |
| Kearney/Cooper Power Systems | Aqua-Seal Kit |
| Preformed | HT Series |
| Plymouth/Bishop | Splice-Wrap |
| Raychem | Rayvolve RVS Series |
| 3M | PST Series 8420 |

Heat Shrink Tubing (with sealant throughout)

| Manufacturer | Type or Catalog No. |
|-----------------------|---|
| AMP | Black heat-shrink tubing |
| CANUSA-EMI | CFW |
| ESP | HSB |
| Panduit | Heat shrink insulating cover and tubing |
| Raychem | WCSM cable sleeves |
| Sigmaform Corporation | Sigmaform heat-shrinkable products |
| 3M | ITCSN tubular cable sleeve |

U hv-1
July 2004

U hv - Cable, Underground
15 kV and 25 kV Cable

Applicable Specification:

Conductor (15 kV):

Conductor (25 kV):

Insulation:

RUS Specification U-1

Copper or Aluminum - #2 AWG through 1000 kcmil

Copper or Aluminum - #1 AWG through 1000 kcmil

Crosslinked Polyethylene (XLP)

(a) indicates Union Carbide 4201 XLP

(b) indicates BP 521 XLP

Tree-retardant Crosslinked Polyethylene (XLP-TR)

(1) indicates Union Carbide 4202 XLP-TR

(2) indicates BP H119Y XLP-TR

(3) indicates BP H118Y XLP-TR

Ethylene Propylene Rubber (EPR)

Neutral:

Copper Concentric Neutral

Jacket:

High Molecular Weight Polyethylene

| Manufacturer | Insulation(s) | Flat Strap Neutral Available |
|-------------------------------------|--------------------------------|------------------------------------|
| Conductores Monterrey, S.A. de C.V. | XLP (a), XLP-TR (1), EPR | No |
| Condumex | XLP (a), XLP-TR (1), EPR | No |
| General Cable | XLP (a,b), XLP-TR (1,3), EPR | Yes |
| Hendrix | XLP (a), XLP-TR (1, 2, 3), EPR | No |
| Hubbell (Kerite) | EPR | Yes |
| Nexans Canada | XLP (a), XLP-TR (1), EPR | No |
| Nexans Italia | EPR | No |
| Okonite | XLP (a), XLP-TR (1), EPR | Yes |
| Pirelli | XLP (a), XLP-TR (1), EPR | Yes |
| Rome | XLP (a), XLP-TR (1), EPR | Yes |
| Southwire | XLP (a), XLP-TR (1), EPR | No |

U hy - Splice, Underground, Permanent

(when ordering, specify conductor size, type, whether copper or aluminum and insulation diameter)

| <u>Manufacturer</u> | <u>Catalog Number</u> |
|-----------------------------|---|
| <u>Cooper Power Systems</u> | <u>15 kV and 25 kV</u> EZ II straight and transition splice #3 through 4/0 <u>35 kV</u> 2603934B Series straight splice |
| <u>Elastimold (ESNA)</u> | <u>15 kv</u> Style 1500S, straight splice, through #1/0 Style 25-S, straight splice, 2/0 through 4/0 Style I5PCJ-1, straight splice, through 4/0 Style 25-Y, Y-splice <u>25 kV</u> Style K-25-S, straight splice Style K-25-Y, Y-splice Style 25PCJ-1, straight splice, through 4/0 <u>35 kV</u> Style M-250-S, straight splice |
| <u>DSG-Canusa</u> | <u>15 kV</u> CJ 10 Series, heat shrinkable joints <u>25 kV</u> CJ 10 Series, heat shrinkable joints <u>35kV</u> CJ 10 Series, heat shrinkable joints |
| <u>Hubbell (Chardon)</u> | <u>15 kV</u> Straight Splice through #1/0, Model 9U16A-100 "Uni-Matic" Through #2/0, Model 9U06A <u>25 kV</u> "Uni-Matic" Through #2/0, Model 9U06A |
| <u>Pirelli</u> | <u>15 kV and 25 kV</u> "Elaspeed" style EPJMe straight splice, #2 through 1000 kcmil |
| <u>3M</u> | <u>(15, 25, 35 kV)</u> 5400 Series Quick Splice/Quick Splice II/Quick Splice III, 15 kV 5411R cable repair splice 5411R/HSJ-I cable repair splice (for jacketed cable) |

U hy - Splice, Underground, Permanent

(When ordering specify conductor size, type, whether copper or aluminum and insulation diameter)

| <u>Manufacturer</u> | <u>Catalog Number</u> |
|-----------------------|--|
| <u>Raychem</u> | <u>15 kV</u> HVS 1510-R__ 200 Amp Splice kit |
| | <u>25 kV</u> For Bare Concentric Neutral Cable: HVS-2510-REAX in-line joint HVS-2510E-R-REAX repair joint For Jacketed Cable: HVS-2510-JCN-REAX in-line joint HVS-2510E-RJ-REAX repair joint |
| | <u>35 kV</u> For Bare Concentric Neutral Cable: HVS-3510E-REAX in-line joint For Jacketed Cable: HVS-3510E-JCN-REAX in-line joint |
| <u>Sigmaform</u> | <u>15 kV</u> SSK Series (Heat Shrink) |
| <u>Tyco (Raychem)</u> | <u>15 kV</u> CAS-15WJ-2, cold-applied splice |
| | <u>25 kV</u> For Jacketed Cable: CAS-28WJ-2, cold-applied splice |
| | <u>35 kV</u> For Jacketed Cable: CAS-35M, cold-applied in-line splice |